Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour: \_\_\_\_\_\_\_\_\_\_\_

**Smoke and Acidic Gases Lab**

\*\*\* For the following experiment: bromthymol blue turns yellow at a pH of 6.0, green at a pH of 7.0 and blue at a pH of 7.6. Any pH lower than 7.0 is acidic; higher than 7.0 is basic. \*\*\*

***Part A***

1. Fill sampling container to the 10 mL line with distilled water.

|  |  |
| --- | --- |
| **Part A** | |
| **Original color** |  |
| **Original pH** |  |
| **Match color** |  |
| **Match pH** |  |

1. Using pipet, add 5 drops of bromthymol blue indicator solution
2. Swirl the solution in the sampling container and record the original color of the solution in the data table.
3. Light a match and place it in the solution in the sampling container and immediately close the lid. Try to capture all of the smoke from the match in the sampling container.
4. Swirl the solution in the sampling container so it can interact with the fumes. Record all observations and the pH of the resulting solution.
5. Rinse the sampling container with distilled water for next use.

***Part B***

1. Fill the sampling container to the 10 mL line with distilled water.
2. Using a pipet, add 5 drops of bromthymol blue indicator solution.
3. Swirl the sampling container and record the color of the solution in the data table.
4. Attach a 2-inch piece of tubing to the end of a syringe.
5. Fill the syringe with outside air.
6. Force the air out of the syringe through the tubing and into the bromthymol blue/water solution by depressing the plunger.
7. Repeat steps 5 and 6 ten times are record all observations in the data table.
8. Rinse the syringe, tubing, and sampling container with distilled water for next use.

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| **Part B** | | | | | | | | | | | |
| **Original color** |  | | | | | | | | | | |
| **Original pH** |  | | | | | | | | | | |
| **Air color** |  |  |  |  |  |  |  |  |  |  |  |
| **Air pH** |  |  |  |  |  |  |  |  |  |  |  |

**Acid Rain Lab**

***Part A***

1. Place a small marble chip in a sampling container.
2. Using a pipet, place 20 drops of unpolluted rainwater on the marble chip. Record observations.
3. Using another pipet, place 20 drop of the simulated acid rain solution on the same marble chip. Record your observations.
4. Rinse the sampling container with distilled water for next use.

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| --- | --- |
| **Part A** | |
| **Marble chip with unpolluted water** |  |
| **Marble chip with polluted water** |  |

***Part B***

|  |  |
| --- | --- |
| **Part B** | |
| **Color of test strip** |  |
| **pH of rainwater** |  |

1. Gather a small sample of rainwater in the sampling container.
2. Dip an acid rain test strip into the water
3. Compare the color of the test strip to the color chart. Record the color of the test strip and the acidity of the rainwater in your area.

***Analysis Questions***

1. What effect does the pH of smoke have on water in the atmosphere?
2. What are some possible sources of acidic gases in air?
3. Explain possible outcomes of high levels of acidic gases in the atmosphere.
4. What effect did the simulated acid rain have on the marble chip?
5. What dies this experiment show about the decay of buildings and statues in metropolitan areas?
6. According your results, are limestone and marble building in your area in danger of deterioration? Why or why not?
7. What effects does acid rain have on plant life and other organisms?